

**AMENDMENTS TO THE CLAIMS:**

Please cancel claims 1, 3-5, 7, 9-13 and 17-21, without prejudice. Kindly amend claims 2, 6, and 8, as shown below. Please add new claims 23-43, as shown below.

This listing of claims will replace all prior versions and listings of claims in the Application:

**Claim 1 (cancelled)**

**Claim 2 (currently amended):** The hydrogen storage metal alloy according to claim [[1]] 23, wherein the alloy temperature (T1) during the hydrogen-absorbing process is brought to a range of from the extremely low temperature in the living areas on the earth to 373K.

**Claims 3 - 5 (cancelled)**

**Claim 6 (currently amended):** The hydrogen storage metal alloy according to claim [[3]] 1, wherein the tissue structure of the above-mentioned suitably adjusted hydrogen storage metal alloy is of a body-centered cubic structure mono phase without any spinodal decomposition phase or has a body-centered cubic structure together with only a minimum spinodal decomposition phase with is unavoidably produced.

**Claim 7 (cancelled)**

**Claim 8 (currently amended):** The method for absorbing and releasing hydrogen according to claim [[7]] 24, wherein the alloy temperature (T1) during the above hydrogen-absorbing process is within a range of from the extremely low temperature in the living areas on the earth to 373K.

**Claims 9-13 (cancelled)**

**Claim 14 (original):** A hydrogen fuel battery equipped with:

a hydrogen storage tank including a hydrogen storage metal alloy,

HAYES SOLOWAY P.C.  
130 W. CUSHING STREET  
TUCSON, AZ 85701  
TEL. 520.882.7623  
FAX. 520.882.7643

175 CANAL STREET  
MANCHESTER, NH 03101  
TEL. 603.668.1400  
FAX. 603.668.8567

a temperature controlling means whereby the above hydrogen storage metal alloy is directly heated or cooled or the atmospheric temperature of the said hydrogen storage metal alloy is raised or cooled,

a fuel battery cell in which hydrogen supplied from the said hydrogen storage tank can be subjected to a chemical change to output an electrical power, and

a controller where a control is done in such a manner that, with regard to the temperature (T1) of the above hydrogen storage metal alloy during the stage of hydrogen absorption, the temperature of the said alloy during at least one period during the release of hydrogen is made higher (T2) than the temperature (T1) thereof during the above hydrogen-absorbing process.

**Claim 15 (original):** The hydrogen fuel battery according to claim 14, wherein the aforementioned controller is capable of approximately controlling a pressure, temperature and flow rate of the hydrogen gas supplied from the above-mentioned hydrogen storage tank to the above-mentioned fuel battery cell.

**Claim 16 (previously presented):** The hydrogen fuel battery according to claim 14, wherein the above-mentioned temperature controlling means is arranged so as to enable the heat discharged from the above-mentioned fuel battery cell or the exhaust gas discharged from the said fuel battery cell to be utilized for the above-mentioned heating.

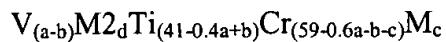
**Claims 17-21 (cancelled)**

**Claim 22 (previously presented):** The hydrogen fuel battery according to claim 15, wherein the above-mentioned temperature controlling means is arranged so as to enable the heat discharged from the above-mentioned fuel battery cell or the exhaust gas discharged from the said fuel battery cell to be utilized for the above-mentioned heating.

HAYES SOLOWAY P.C.  
130 W. CUSHING STREET  
TUCSON, AZ 85701  
TEL. 520.882.7623  
FAX. 520.882.7643

175 CANAL STREET  
MANCHESTER, NH 03101  
TEL. 603.668.1400  
FAX. 603.668.8567

**Claim 23 (new):** A hydrogen storage metal alloy which has as its main phase a body-centered cubic structure-type phase exerting a two-stage or inclined plateau characteristic in a hydrogen storage amount vs hydrogen pressure relation, in which the composition ratio of constituent metals for the alloy is adjusted to an appropriate range in order to reduce the stability of the hydrogen occluded in the alloy during the low-pressure plateau region or the lower plateau region of the inclined plateau such that an alloy temperature (T2) during at least a period in a hydrogen release process can be brought to higher than an alloy temperature (T1) in a hydrogen-absorption process (T2 > T1) whereby at least part of the occluded hydrogen will be made desorbable during the low-pressure plateau region in the above-mentioned two-stage plateau or the lower plateau region of the inclined plateau, wherein the hydrogen storage metal alloy is an alloy having not only a suitably adjusted composition to reduce the stability of the occluded hydrogen but also a fundamental composition of the formula:



wherein  $0 \leq a \leq 70$  at%,  $-10 \leq b \leq 10 + c$ ,  $0 \leq c$ ,  $0 \leq d \leq a$ , M is at least one or more members selected from the group consisting of Nb, Mo, Ta, W, Mn, Fe, Al, B, C, Co, Cu, Ge, Ln (various lanthanoid metals), N, Ni, P and Si, and M2 is at least one or more members selected from the group consisting of Mo, Nb, Ta, W, Mn, Fe and Al.

**Claim 24 (new):** The hydrogen storage metal alloy according to claim 23, wherein the tissue structure of the above-mentioned suitably adjusted hydrogen storage metal alloy is of a body-centered cubic structure mono phase without any spinodal decomposition phase or has a body-centered cubic structure together with only a minimum spinodal decomposition phase which is unavoidably produced.

HAYES SOLOWAY P.C.  
130 W. CUSHING STREET  
TUCSON, AZ 85701  
TEL. 520.882.7623  
FAX. 520.882.7643

175 CANAL STREET  
MANCHESTER, NH 03101  
TEL. 603.668.1400  
FAX. 603.668.8567

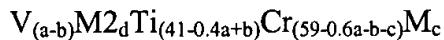
**Claim 25 (new):** A method for absorbing and releasing hydrogen using a hydrogen storage metal alloy which comprises:

applying repeatedly hydrogen pressurization and depressurization to the hydrogen storage metal alloy of a body-centered cubic structure-type phase exerting a two-stage or inclined plateau characteristic in a hydrogen storage amount vs hydrogen pressure relation in an appropriate fashion to absorb and release hydrogen, and

at least at one stage during the release of hydrogen, making the temperature (T2) of the above-mentioned hydrogen storage metal alloy higher than the temperature (T1) of the hydrogen storage metal alloy during the hydrogen absorption process (T2 > T1)

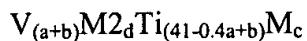
wherein the hydrogen storage metal alloy is an alloy having not only a suitably adjusted composition to reduce the stability of the occluded hydrogen but also

(1) a fundamental composition of the formula:



wherein  $0 \leq a \leq 70$  at%,  $-10 \leq b \leq 10 + c$ ,  $0 \leq c$ ,  $0 \leq d \leq a$ , M is at least one or more members selected from the group consisting of Nb, Mo, Ta, W, Mn, Fe, Al, B, C, Co, Cu, Ge, Ln (various lanthanoid metals), N, Ni, P and Si, and M2 is at least one or more members selected from the group consisting of Mo, Nb, Ta, W, Mn, Fe and Al, or

(2) a fundamental composition of the formula:



wherein  $0 \leq a \leq 70$  at%,  $-10 \leq b \leq 10 + c$ ,  $0 \leq c$ ,  $0 \leq d \leq a$ , M is at least one or more members selected from the group consisting of Nb, Mo, Ta, W, Mn, Fe, Al, B, C, Co, Cu, Ge,

HAYES SOLOWAY P.C.  
130 W. CUSHING STREET  
TUCSON, AZ 85701  
TEL. 520.882.7623  
FAX. 520.882.7643

175 CANAL STREET  
MANCHESTER, NH 03101  
TEL. 603.668.1400  
FAX. 603.668.8567

Ln (various lanthanoid metals), N, Ni, P and Si, and M2 is at least one or more members selected from the group consisting of Mo, Nb, Ta, W, Fe and Al.

**Claim 26 (new):** The method for absorbing and releasing hydrogen according to claim 25, wherein the tissue structure of the above-mentioned suitably adjusted hydrogen storage metal alloy is of a body-centered cubic structure mono phase without any spinodal decomposition phase or has a body-centered cubic structure together with only a minimum spinodal decomposition phase which is unavoidably produced.

**Claim 27 (new):** The method for absorbing and releasing hydrogen according to claim 25, wherein the alloy temperature (T1) during the above hydrogen-absorbing process is within a range of from the extremely low temperature in the living areas on the earth to 373K.

**Claim 28 (new):** The method for absorbing and releasing hydrogen according to claim 25, wherein the composition ratio of the constituent metals for the alloy is adjusted to an appropriate range in order to reduce the stability of the hydrogen occluded in the alloy during the low-pressure plateau region or the lower plateau region of the inclined plateau such that the temperature of the said alloy can be brought to the above high temperature (T2) whereby at least part of the occluded hydrogen will be made desorbable during the low-pressure plateau region in the above-mentioned two-stage plateau or the lower plateau region of the inclined plateau.

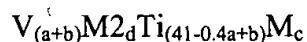
**Claim 29 (new):** The method for absorbing and releasing hydrogen according to claim 27, wherein the composition ratio of the constituent metals for the alloy is adjusted to an appropriate range in order to reduce the stability of the hydrogen occluded in the alloy during the low-pressure plateau region or the lower plateau region of the inclined plateau such that the temperature of the said alloy can be brought to the above high temperature (T2) whereby at

HAYES SOLOWAY P.C.  
130 W. CUSHING STREET  
TUCSON, AZ 85701  
TEL. 520.882.7623  
FAX. 520.882.7643

175 CANAL STREET  
MANCHESTER, NH 03101  
TEL. 603.668.1400  
FAX. 603.668.8567

least part of the occluded hydrogen will be made desorbable during the low-pressure plateau region in the above-mentioned two-stage plateau or the lower plateau region of the inclined plateau.

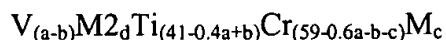
**Claim 30 (new):** The method for absorbing and releasing hydrogen according to claim 25, wherein the hydrogen storage metal alloy is an alloy having not only a suitably adjusted composition to reduce the stability of the occluded hydrogen but also a fundamental composition of the formula:



wherein  $0 \leq a \leq 70$  at%,  $-10 \leq b \leq 10 + c$ ,  $0 \leq c$ ,  $0 \leq d \leq a$ , M is at least one or more members selected from the group consisting of Nb, Mo, Ta, W, Mn, Fe, Al, B, C, Co, Cu, Ge, Ln (various lanthanoid metals), N, Ni, P and Si, and M2 is at least one or more members selected from the group consisting of Mo, Nb, Ta, W, Fe and Al.

**Claim 31 (new):** The method for absorbing and releasing hydrogen according to claim 30, wherein the tissue structure of the above-mentioned suitably adjusted hydrogen storage metal alloy is of a body-centered cubic structure mono phase without any spinodal decomposition phase or has a body-centered cubic structure together with only a minimum spinodal decomposition phase which is unavoidably produced.

**Claim 32 (new):** The method for absorbing and releasing hydrogen according to claim 25, wherein the hydrogen storage metal alloy is an alloy having not only a suitably adjusted composition to reduce the stability of the occluded hydrogen but also a fundamental composition of the formula:



HAYES SOLOWAY P.C.  
130 W. CUSHING STREET  
TUCSON, AZ 85701  
TEL. 520.882.7623  
FAX. 520.882.7643

175 CANAL STREET  
MANCHESTER, NH 03101  
TEL. 603.668.1400  
FAX. 603.668.8567

wherein  $0 \leq a \leq 70$  at%,  $-10 \leq b \leq 10 + c$ ,  $0 \leq c$ ,  $0 \leq d \leq a$ , M is at least one or more members selected from the group consisting of Nb, Mo, Ta, W, Mn, Fe, Al, B, C, Co, Cu, Ge, Ln (various lanthanoid metals), N, Ni, P and Si, and M2 is at least one or more members selected from the group consisting of Mo, Nb, Ta, W, Mn, Fe and Al.

**Claim 33 (new):** The method for absorbing and releasing hydrogen according to claim 32, wherein the tissue structure of the above-mentioned suitably adjusted hydrogen storage metal alloy is of a body-centered cubic structure mono phase without any spinodal decomposition phase or has a body-centered cubic structure together with only a minimum spinodal decomposition phase which is unavoidably produced.

**Claim 34 (new):** The hydrogen fuel battery according to claim 14, wherein the hydrogen storage metal alloy has as its main phase a body-centered cubic structure-type phase exerting a two-stage or inclined plateau characteristic in a hydrogen storage amount vs hydrogen pressure relation, in which the composition ratio of constituent metals for the alloy is adjusted to an appropriate range in order to reduce the stability of the hydrogen occluded in the alloy during the low-pressure plateau region or the lower plateau region of the inclined plateau such that an alloy temperature (T2) during at least a period in a hydrogen release process can be brought to higher than an alloy temperature (T1) in a hydrogen-absorption process ( $T2 > T1$ ) whereby at least part of the occluded hydrogen will be made desorbable during the low-pressure plateau region in the above-mentioned two-stage plateau or the lower plateau region of the inclined plateau.

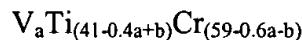
**Claim 35 (new):** The hydrogen fuel battery according to claim 34, wherein the alloy temperature (T1) during the hydrogen-absorbing process is brought to a range of from the extremely low temperature in the living areas on the earth to 373K.

HAYES SOLOWAY P.C.  
130 W. CUSHING STREET  
TUCSON, AZ 85701  
TEL. 520.882.7623  
FAX. 520.882.7643

175 CANAL STREET  
MANCHESTER, NH 03101  
TEL. 603.668.1400  
FAX. 603.668.8567

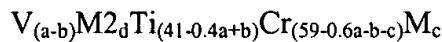
**Claim 36 (new):** The hydrogen fuel battery according to claim 35, wherein the hydrogen storage metal alloy is a V alloy not only having a suitably adjusted composition to reduce the stability of the occluded hydrogen but also containing 0 to 95 at% of at least one or more members selected from the group consisting of Nb, Ta, W, Mo, Ti, Cr, Mn, Fe, Al, B, Co, Cu, Ge, Ni and Si.

**Claim 37 (new):** The hydrogen fuel battery according to claim 36, wherein the hydrogen storage metal alloy is an alloy having not only a suitably adjusted composition to reduce the stability of the occluded hydrogen but also a fundamental composition of the formula:



wherein  $0 \leq a \leq 70$  at% and  $-10 \leq b \leq 10$  at%.

**Claim 38 (new):** The hydrogen fuel battery according to claim 36, wherein the hydrogen storage metal alloy is an alloy having not only a suitably adjusted composition to reduce the stability of the occluded hydrogen but also a fundamental composition of the formula:



wherein  $0 \leq a \leq 70$  at%,  $-10 \leq b \leq 10 + c$ ,  $0 \leq c$ ,  $0 \leq d \leq a$ , M is at least one or more members selected from the group consisting of Nb, Mo, Ta, W, Mn, Fe, Al, B, C, Co, Cu, Ge, Ln (various lanthanoid metals), N, Ni, P and Si, and M2 is at least one or more members selected from the group consisting of Mo, Nb, Ta, W, Mn, Fe and Al.

**Claim 39 (new):** The hydrogen fuel battery according to claim 36, wherein the tissue structure of the above-mentioned suitably adjusted hydrogen storage metal alloy is of a body-centered cubic structure mono phase without any spinodal decomposition phase or has a body-centered

HAYES SOLOWAY P.C.  
130 W. CUSHING STREET  
TUCSON, AZ 85701  
TEL. 520.882.7623  
FAX. 520.882.7643

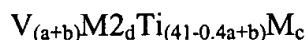
175 CANAL STREET  
MANCHESTER, NH 03101  
TEL. 603.668.1400  
FAX. 603.668.8567

cubic structure together with only a minimum spinodal decomposition phase which is unavoidably produced.

**Claim 40 (new):** The hydrogen fuel battery according to claim 37, wherein the tissue structure of the above-mentioned suitably adjusted hydrogen storage metal alloy is of a body-centered cubic structure mono phase without any spinodal decomposition phase or has a body-centered cubic structure together with only a minimum spinodal decomposition phase which is unavoidably produced.

**Claim 41 (new):** The hydrogen fuel battery according to claim 38, wherein the tissue structure of the above-mentioned suitably adjusted hydrogen storage metal alloy is of a body-centered cubic structure mono phase without any spinodal decomposition phase or has a body-centered cubic structure together with only a minimum spinodal decomposition phase which is unavoidably produced.

**Claim 42 (new):** The hydrogen fuel battery according to claim 36, wherein the hydrogen storage metal alloy is an alloy having not only a suitably adjusted composition to reduce the stability of the occluded hydrogen but also a fundamental composition of the formula:



wherein  $0 \leq a \leq 70$  at%,  $-10 \leq b \leq 10 + c$ ,  $0 \leq c$ ,  $0 \leq d \leq a$ , M is at least one or more members selected from the group consisting of Nb, Mo, Ta, W, Mn, Fe, Al, B, C, Co, Cu, Ge, Ln (various lanthanoid metals), N, Ni, P and Si, and M2 is at least one or more members selected from the group consisting of Mo, Nb, Ta, W, Fe and Al.

**Claim 43 (new):** The hydrogen fuel battery according to claim 42, wherein the tissue structure of the above-mentioned suitably adjusted hydrogen storage metal alloy is of a body-centered cubic structure mono phase without any spinodal decomposition phase or has a body-centered

HAYES SOLOWAY P.C.  
130 W. CUSHING STREET  
TUCSON, AZ 85701  
TEL. 520.882.7623  
FAX. 520.882.7643

175 CANAL STREET  
MANCHESTER, NH 03101  
TEL. 603.668.1400  
FAX. 603.668.8567

cubic structure together with only a minimum spinodal decomposition phase which is unavoidably produced.

**HAYES SOLOWAY P.C.**  
130 W. CUSHING STREET  
TUCSON, AZ 85701  
TEL. 520.882.7623  
FAX. 520.882.7643

---

175 CANAL STREET  
MANCHESTER, NH 03101  
TEL. 603.668.1400  
FAX. 603.668.8567